

## Unit 6 Lesson 2A Continued...

Quiz: Your quiz on Lesson 1 should take no more than 40 minutes.

Classwork / Homework: Complete the following problems on a separate sheet. You have the full class-time after the quiz to work on these. What you do not finish is your HW.

Use one or more of the six sum and difference identities to solve Exercises 13–54.

In Exercises 13–24, find the exact value of each expression.

13.  $\sin(45^\circ - 30^\circ)$       14.  $\sin(60^\circ - 45^\circ)$   
15.  $\sin 105^\circ$       16.  $\sin 75^\circ$   
17.  $\cos(135^\circ + 30^\circ)$       18.  $\cos(240^\circ + 45^\circ)$   
19.  $\cos 75^\circ$       20.  $\cos 105^\circ$

In Exercises 25–32, write each expression as the sine, cosine, or tangent of an angle. Then find the exact value of the expression.

25.  $\sin 25^\circ \cos 5^\circ + \cos 25^\circ \sin 5^\circ$   
26.  $\sin 40^\circ \cos 20^\circ + \cos 40^\circ \sin 20^\circ$

29.  $\sin \frac{5\pi}{12} \cos \frac{\pi}{4} - \cos \frac{5\pi}{12} \sin \frac{\pi}{4}$   
30.  $\sin \frac{7\pi}{12} \cos \frac{\pi}{12} - \cos \frac{7\pi}{12} \sin \frac{\pi}{12}$

In Exercises 33–54, verify each identity.

33.  $\sin\left(x + \frac{\pi}{2}\right) = \cos x$       34.  $\sin\left(x + \frac{3\pi}{2}\right) = -\cos x$   
35.  $\cos\left(x - \frac{\pi}{2}\right) = \sin x$       36.  $\cos(\pi - x) = -\cos x$   
39.  $\sin(\alpha + \beta) + \sin(\alpha - \beta) = 2 \sin \alpha \cos \beta$   
40.  $\cos(\alpha + \beta) + \cos(\alpha - \beta) = 2 \cos \alpha \cos \beta$   
41.  $\frac{\sin(\alpha - \beta)}{\cos \alpha \cos \beta} = \tan \alpha - \tan \beta$   
42.  $\frac{\sin(\alpha + \beta)}{\cos \alpha \cos \beta} = \tan \alpha + \tan \beta$   
45.  $\cos(\alpha + \beta) \cos(\alpha - \beta) = \cos^2 \beta - \sin^2 \alpha$   
46.  $\sin(\alpha + \beta) \sin(\alpha - \beta) = \cos^2 \beta - \cos^2 \alpha$   
47.  $\frac{\sin(\alpha + \beta)}{\sin(\alpha - \beta)} = \frac{\tan \alpha + \tan \beta}{\tan \alpha - \tan \beta}$

\* I strongly recommend you draw a diagram on the coordinate plane to help w/ 57–62.  
(hint: SOH-CAH-TOA)

In Exercises 57–64, find the exact value of the following under given conditions:

- a.  $\cos(\alpha + \beta)$       b.  $\sin(\alpha + \beta)$   
57.  $\sin \alpha = \frac{3}{5}$ ,  $\alpha$  lies in quadrant I, and  $\sin \beta = \frac{5}{13}$ ,  $\beta$  lies in quadrant II.  
58.  $\sin \alpha = \frac{4}{5}$ ,  $\alpha$  lies in quadrant I, and  $\sin \beta = \frac{7}{25}$ ,  $\beta$  lies in quadrant II.

61.  $\cos \alpha = \frac{8}{17}$ ,  $\alpha$  lies in quadrant IV, and  $\sin \beta = -\frac{1}{2}$ ,  $\beta$  lies in quadrant III.  
62.  $\cos \alpha = \frac{1}{2}$ ,  $\alpha$  lies in quadrant IV, and  $\sin \beta = -\frac{1}{3}$ ,  $\beta$  lies in quadrant III.